
TO: CITY MANAGER **DATE:** 2015 November 17

FROM: DIRECTOR ENGINEERING **FILE:** 31000 06
Ref: Stoney Creek

SUBJECT: STONEY CREEK CULVERT AND CREEK REHABILITATION PROJECT

PURPOSE: The purpose of this report is to inform Council on the need and timing of undertaking the Stoney Creek Culvert and Creek Rehabilitation Project, the release of sediment to the receiving environment and follow-up remedial measures undertaken to minimize downstream impacts to Stoney Creek.

REPORT

1. **THAT** this report be received for information.

1.0 INTRODUCTION:

The recent release of sediment into Tributary 3A of Stoney Creek as a result of construction activities relating to the Stoney Creek Culvert and Creek Rehabilitation Project has raised questions regarding the timing of the Project, and the incident itself.

The purpose of this report is to inform Council on the need and timing of undertaking the Stoney Creek Culvert and Creek Rehabilitation Project, the release of sediment to the receiving environment and follow-up remedial measures undertaken to minimize downstream impacts to Stoney Creek.

2.0 STONEY CREEK CULVERT AND CREEK REHABILITATION PROJECT

In November 2014, City crews and Stoney Creek Streamkeeper members noticed the beginning of some creek bank erosion near the outlet of the Stoney Creek Tributary 3A culvert under Gagliardi Way. The area where this erosion was noticed is shown as the "Construction Area" (see *Attachments #1 and #5*). Staff continued monitoring this area through the winter in order to gather a full understanding of the causes and properly scope design and repair works.

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In early March 2015, monitoring showed increased erosion to the creek bank. Erosion had progressed to a point where trees in the Construction Area had fallen as a result of their roots being undermined (see Attachment #2). Video inspection of the culvert found that the bottom of the corrugated pipe showed signs of corrosion necessitating culvert repair in addition to the creek rehabilitation (see Attachment #3).

Based on this information, staff determined that the rehabilitation of this culvert and stabilization of the creek bed and banks was a high priority that needed to be completed before the next winter season. By the end of March 2015 the scope of work was developed and a Request for Proposal was issued for design of the project. The scope of work included relining of the culvert, installation of new headwalls at the inlet and outfall of the culvert, energy dissipation measures, creek bank stabilization, and revegetation of the construction area.

In July 2015, ISL Engineering (the City's Engineer) completed the design, notified the BC Ministry of Forests, Lands and Natural Resource Operations (MoFLNRO) and issued a tender for construction on BC Bid. The construction contract was awarded to A.C. Paving in August 2015. In September the City reached the end of the 45 day period for MoFLNRO to comment on the Project and the construction contractor was given notice to proceed. While the proposed work was being initiated towards the end of the fisheries window, it was deemed important enough to complete the work. To this end, regulatory authorities were aware of the timing of the work.

2.1 SLOPE FAILURE

By late October, construction was nearly complete. All of the standard protocols for working in and around streams were in place and work was being undertaken without any incident. Clean material had been brought in and placed to form a new stabilized slope adjacent to the culvert along Gaglardi Way (see Attachment #5). The new lining for the culvert was in place and grouting was under way to secure it.

On 2015 October 30, an unfortunate incident occurred. The bypass pumps at Flow Bypass #1 that isolated the Construction Area from water (see Attachment #1) were compromised by AC Paving's employee who was maintaining a filter screen on the pump and got his boot sucked into the inlet hose of the pump. In absence of the bypass, the upstream drainage flows overtopped the cofferdam and water flowed through the Construction Area sending debris to the Bypass #2 pump discharge hoses at the Ash Grove inlet. This subsequent action caused the bypass pumps and storm sewer plug at Flow Bypass #2 to be compromised. At this point, the Construction Area was taking on full drainage flows and caused the newly placed slope to fail with a rush of water which transported the sediment from the Construction Area downstream.

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Given the proximity of the Kinder Morgan Canada (KMC) pipeline near the work area, KMC was notified immediately and was on site shortly following the slope failure. Kinder Morgan made the decision to expose its pipe using vacuum trucks and support it with a mobile crane to lessen the chance of failure. Two lanes of Gaglardi Highway were closed for safety reasons. Within several hours, construction crews re-established control of the upstream flows and the slope erosion. This was the key incident which was the cause of off-site impacts from the worksite.

In response to this event, ISL and AC Paving's environmental staff undertook assessment of downstream impacts of the slope failure. Initial investigations identified two areas where fine sediment was pooling and would benefit from immediate removal (see Attachment #4). On 2015 November 10, removal of deposited sediment fines was undertaken at these locations by AC paving to minimize further downstream impacts. ISL is following up with AC Paving regarding potential mid to long term mitigation measures within and downstream of Tributary 3A of Stoney Creek. Any agreed upon mitigation measures would be undertaken during 2016 instream window. Staff have met with Stoney Creek Streamkeeper representatives and provided them with an update on project timing, cause of the key incident and remedial measures which address impacts attributable to this incident.

ISL and AC Paving's geotechnical engineers have been monitoring Gaglardi Way in the Construction Area and are in the process of undertaking further assessment to determine the cause of minor road subsidence in the slow lane and determining remedial options. In the interim, the two lanes on Gaglardi Highway remain closed until further notice.

The project is expected to be complete by 2015 November 27. The slope has been rebuilt and is fully stabilized. Energy dissipaters on the outlet of the culvert are performing as designed, but have been adjusted to ensure calmer outflows.

3.0 CONCLUSION

The Stoney Creek Culvert and Creek Rehabilitation Project was undertaken in response to increased creek bank erosion and the potential of downstream impacts. The work was being undertaken by the City's contractor with all the standard protocols in place when working in and around streams. The work was largely completed when an unfortunate incident occurred which triggered a series of subsequent events which resulted in release of sediments into Stoney Creek Tributary 3A. In response, the City's Engineer and contractor undertook initial stream assessment and identified locations to remove sediment deposits. This work was completed and potential mid to long term remedial measures within and downstream of Stoney Creek Tributary 3A which address impacts to attributable to this incident are being reviewed.

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Agreed upon measures may be undertaken during 2016 instream window. The Engineer's and contractor's geotechnical engineers are assessing Gaglardi Highway near the Construction Area to determine the cause of minor settlement in the slow lane and determining remedial options.

This is provided for Council's information.

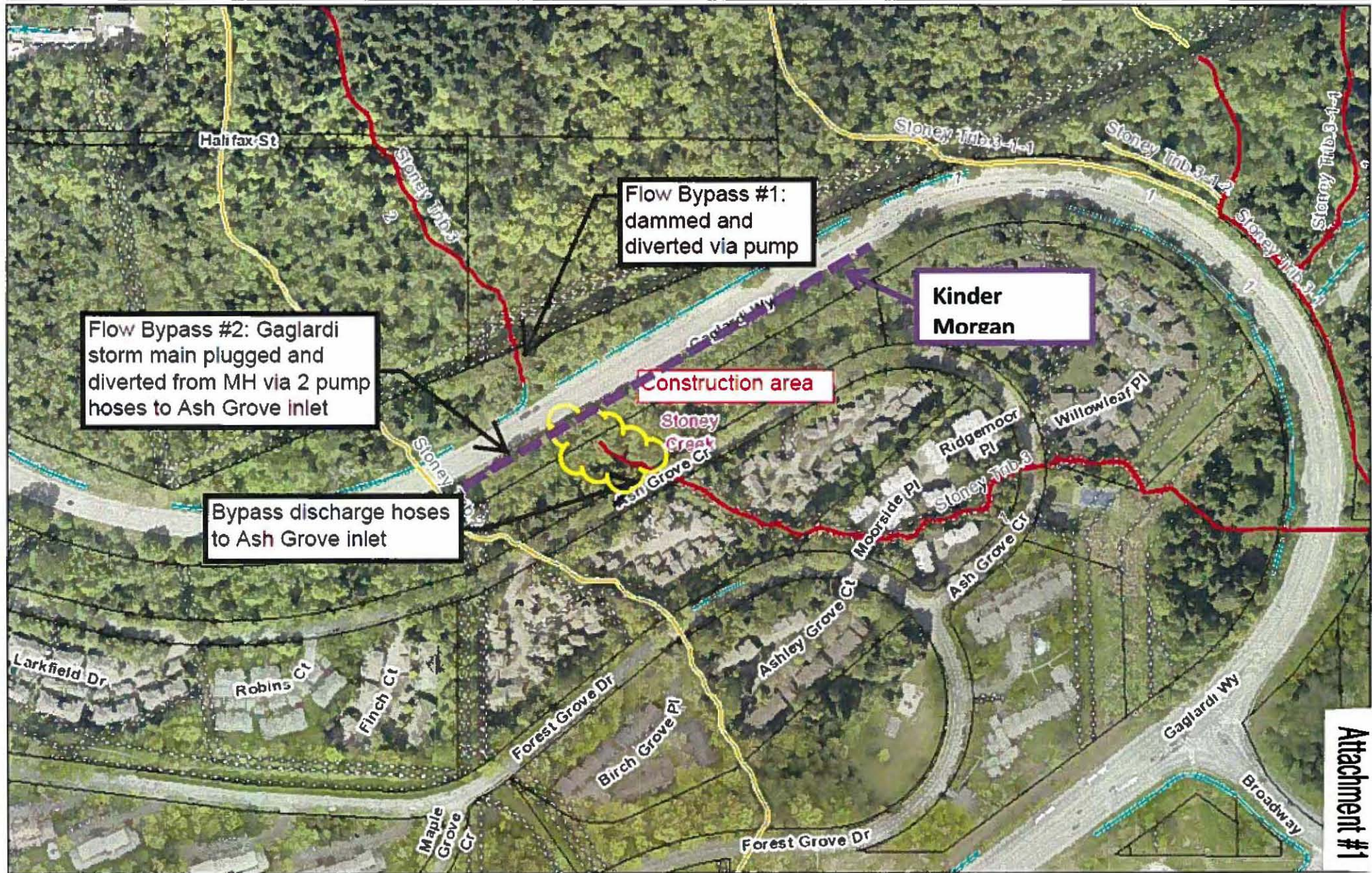


Leon A. Gous, P.Eng, MBA
DIRECTOR ENGINEERING

Attachments

JL/ac

Copied to: City Manager
Deputy City Managers (2)
Director Planning and Building
Director Parks, Recreation & Cultural Services
City Solicitor
Risk Manager

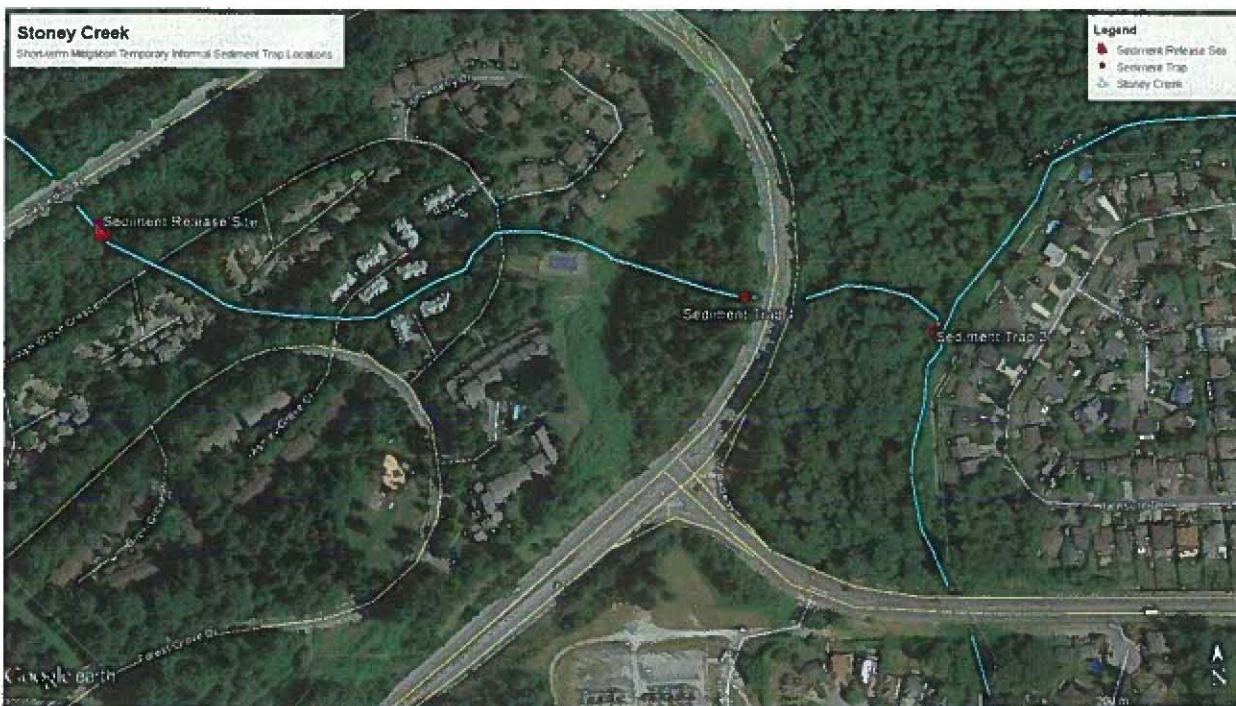




Picture of fallen tress found in the construction area due to erosion of the slope.



Culvert showing signs of corrosion with holes at bottom of the pipe



Areas where sediment naturally pooled were cleaned out by vacuum truck on November 10th.

